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ABSTRACT

The influence of the concept of organizational culture on computer use by colleges and universities is discussed, and five case studies of anonymous northeast colleges are presented. Attention is directed to the extent and nature of the connections between computer use and organizational factors, both structural and cultural. Structural influences on academic computer use included personnel, facilities, and allocation policy. In addition, three manifestations of culture (saga, history, and symbols) influenced how each institution used and managed computing for research and instruction. Saga is an indication of the institution's values, ideology, and beliefs. Of particular interest was the history of computing at each school and the identification of key individuals. Finally, since symbols identify what is important to individuals and how they view their ideology, symbols can demonstrate the importance placed on computing at the school. Each of the institutions had a distinct mission and culture that affected cumputer use. For each college, information is presented on eight institutional characteristics, characteristics of computer personnel and facilities, the computer allocation policy, and characteristics of computer use. (SW)

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COMPUTING AND THE CULTURES OF HIGHER EDUCATION

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ABSTRACT

Colleges and universities continue to have difficulty managing and using computer resources. The literature suggests structural solutions which experience shows are inadequate to solve such problems. This article introduces the concept of organizational culture as another influence in computer use and demonstrates its affects on computing through five case studies.

Every college campus has its own story to tell about computing. Banks Business College is typical. (Institutions are disguised to protect confidentiality.) Statistics show that the number of hours students used the college's computer increased steadily over a ten year period. But closer examination uncovered the fact that fewer and fewer courses required computer use. While overall use appeared to have increased, actual penetration of computing in the curriculum declined. Standish College illustrates the common story of an institution that has done little with computing. Students use several terminals to access a computer at a nearby college. Demand increased competition for terminals to a point where faculty did not give computer assignments. When this happened Standish administrators were unsure how to remedy the situation most effectively. They do not fully understand academic computing. Concord College also faced the problem of competition for scarce computing resources. But at Concord the problem arose because a program designed to integrate computing into the liberal arts curriculum had been highly successful. Large numbers of students and faculty use Concord's computer, and demand for the resource simply outstripped the supply. These stories illustrate an all too familiar fact. Educational institutions are often unable to take advantage of an important resource -- computing.

The literature on academic computer resources (the use of computing for research and instruction) suggests structural solutions to managerial problems such as those outlined above. Its advice focuses on organizational authority, responsibility, and control. Despite the

solutions available in the literature, many colleges face problems managing computer resources. Management is always more difficult under conditions of organizational uncertainty and ambiguity that exist in colleges and universities (5, 19). The concept of organizational culture is a useful explanation for behavior under such conditions (12). Its application to academic computing is no exception. Organizational culture influences computer use on college and university campuses. It further explains the current use of computing in higher education and suggests how computing might develop in the future. Institutions should consider cultural influences when developing computer resources. But what is organizational culture and how does one observe and measure it?

Organizational culture has recently received increased attention. Researchers have observed the influence of organizational values, beliefs, and ideologies on corporate policy and managerial style. Culture helps an organization maintain its unique character through its influence on the people who work in the organization (6). It communicates beliefs and values which give meaning to life within the organization (17). Organizational culture is a "bass clef" that conveys meaning to employees, a "compass" that gives direction, and the "shared values and spiritual fabric" that bind the organization together (18). An organization's culture helps employees know how to behave and make meaning or sense out of the behavior of others. It also affects how managers perceive and resolve problems.

Pettigrew (20) defines organizational culture as "the amalgam of beliefs, ideology, language, ritual, and myth." He states that these cultural concepts explain and prescribe behavior because they codify meaning in a publicly and collectively accepted manner. They are also

part of the logitudinal growth and development of an organization. Their past influence on organizational life affects current behavior and future plans (9). Thus understanding culture increases understanding of current and future decisions and actions.

Identifying Organizational Culture. Although the literature acknowledges organizational culture and its impact, concise means to define and measure it are not available. Students in introductory sociology courses read broad definitions that speak of ideals, values, and symbols. Schwartz and Davis quote anthropologist Clyde Kluckholm's definition of culture as "the set of habitual and traditional ways of thinking, feeling, and reacting that are characteristic of the ways a particular society meets its problems at a particular point in time" (24, p. 32). Common to definitions of culture are concepts such as values, beliefs, and ideologies that are difficult to measure. But to dismiss culture for this reason ignores the fact that it influences many aspects of organizational life. While culture resists measurement and codification, it is not that which cannot be measured.

The problem is making explicit the tacit and implicit values, beliefs, and ideologies that comprise culture. Means must be found to make it visible. The most commonly mentioned method is observation of behavior. Detailed observation over time and "thick description" illuminate culture (7). Schwartz and Davis make it sound somewhat easier.

> All one has to do to get a feel for how the different cultures of competing businesses manifest themselves is to spend a day visiting each . . . there are characteristic ways of making decisions, relating to bosses, and choosing people to fill key jobs. These mundane routines, buried deep in companies' cultures, may be the most accurate reflections of why things work the way they do. (24, p. 30)

While it may be true that culture can be observed by spending time in an organization, it certainly is not the most helpful means of understanding the concept. A more useful tactic is to examine manifestations of culture at work (23). From specific actions and words one can infer back to organizational culture. This article uses such a method to demonstrate that individual colleges and universities have distinct cultures which influence academic computing.

Organizational Culture at Work. Culture interacts with organizational structure and computer use. It does not supplant the structural affects noted in the literature on computing. Figure 1 represents the model. This article investigates the extent and nature of the connections between the organizational factors and computer use, and it illustrates their influence on academic computing.

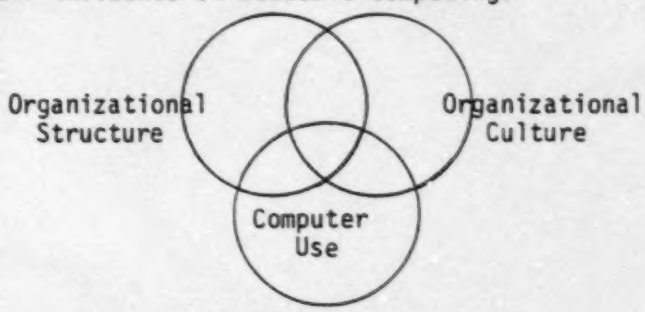

Figure 1. Intersecting Organizational Spheres

In order to study both the structural and cultural influences on computer use in higher education, I investigated computing at five colleges located in the Northeast (13). Tables 1 to 5 present factual information about the research sites. Trowbridge Technical Institute views computing as a subject of study and uses it as a tool for engineering majors. Banks Business College requires computer literacy as part of each student's management education. Quincy College stresses

the practical nature of computing for its career oriented students. Standish College uses minimal computer resources to support its Catholic liberal arts education. Concord College has integrated computing into a traditional liberal arts curriculum. At each campus I interviewed key administrators and faculty members who are involved with computing, who are knowledgeable about the institution, or who know both areas. Review of documents, reports, and computer-related statistics provided additional information.

The research demonstrates that the relationships between organizational structure, organizational culture, and computing exist and influence each other, not that they exist at all institutions. The article is thus exploratory in nature. It briefly sets the context through review of the structural concepts of computing widely discussed in the literature. It then focuses on three manifestations of organizational culture and illustrates their influence on computing. Finally it discusses the implications of this study for researchers and practitioners.

Structural Influences

A small body of literature describes structural solutions to computer-related managerial problems. Structural solutions involve formal systems of organizational authority, responsibility, and control. Personnel, facilities, and policy for allocating computer resources among users are the major structural characteristics. The principal approaches to each are briefly described and illustrated below. Mosmann (15) and Robbins, Dorn, and Skelton (22) provide more detailed treatments of the structural characteristics.

Personnel. The major focal point of the structural literature is who manages the computer and where the manager fits within the institution. A computer center director is the most common personnel structure. An individual in this position is a technician and manager who is responsible for the day-to-day operation of the computer center. A computer center director can report to a number of positions including the president and either the chief academic or administrative officer. If the director is highly placed in the administrative structure and is a policy maker with overall responsibility for computing rather than a technician, the individual is a "computer czar" (15). Other personnel structures include management by a committee or an external organization.

With the exception of Standish College which has no staff member exclusively designated for computer resources, all of the research sites rely on a computer center director. These individuals directly influence computer use at their college. At Quincy College, for example, the director is known as the individual with the answers. He is consulted extensively and plays a crucial role in any computer-related decision or application. Concord's director is responsible in large part for the successful implementation of a computer literacy program. Standish, with its relative lack of computing, illustrates the problems that can arise when administrators are not fluent with computing. Without someone who is familiar and comfortable with computers, computing efforts often falter.

Computing also needs the support of top management if it is to flourish. Concord's administration provides philosophical if not financial support for computing. Their outlook, when coupled with

external funding, has permitted computing to grow and has encouraged many users to become involved with computing efforts. Banks Business College illustrates administrators who have not supported computing as explicitly. The computer center director at Banks reports to the financial vice president. This individual emphasizes the fiscal aspects of computer-related decisions and thus does not encourage the growth of academic computing. This frustrates some faculty members' efforts to expand computer use. It was partially responsible for the declining penetration of computing in Banks' curriculum mentioned at the outset of this article.

All of the colleges also rely on computer committees. These are either policy committees that advise the computer center director or user committees that provide a communication link between computer staff members and users. At Quincy the committee is one means of disseminating information about computing and at Trowbridge Tech the committee coordinates campus-wide computer policy. Because of the lack of top management support at Banks, the faculty committee at that institution became a forum for airing complaints and planning alternate strategies for the further development of computing.

Facilities. In the past most campuses have had centralized computer resources. One large facility available for all users was more efficient and provided greater computer power than several small systems. As computers become smaller and less expensive, however, there is a growing tendency for institutions to decentralize facilities. Under such an arrangement more than one computer center is available on the campus. The increased use of mini and microcomputers, and the disparate needs of administrative and academic computer users have

strengthened the trend towards decentralization. Networking, defined here as using telecommunications to access a computer facility that is geographically removed from the user's institution, is a third form of computer facility. It can provide basic computer services or supplement other computer systems by meeting specialized needs.

Banks took an unusual approach to computer facilities. Soon after introducing computing, administrators realized that the college could not financially support the necessary computer resources. Thus Banks was instrumental in the development of regional resource-sharing arrangements. Banks' students and faculty had access to more computer resources than would have been available without the combined efforts of local colleges and schools. Recently, however, group membership declined as member colleges purchased their own computers. Banks has had to absorb a larger proportion of the costs of computing and some faculty members have become dissatisfied with available computer resouces..

Decentralized facilities predominate at the other research sites. The process of decentralization has made computing more readily available at all the campuses. Faculty members at Quincy, for example, can reserve an Apple Computer for use in the classroom. The heavy use of networking at Quincy also permits a wide variety of computer applications with little long-term investment by the institution. Trowbridge Tech has the greatest decentralization. Specialized mini and microcomputers are readily available and widely used. The availability of word processing programs also illustrates the influence of facilities on computer use. Banks and Concord encourage the use of word processing and approximately one-quarter of their students take advantage of it. This involves students and faculty members with the computer and greatly increases demand for the resource.

Allocation Policy. The methods used to allocate computer resources among competing users is a third structural issue. Allocation policy is a means of exerting control over a potentially scarce resource. The free access allocation philosophy states that all users should have as much of the resource as they require and they should not have to pay for it. Free access is a common policy, reminiscent of library policy which provides resources in much the same fashion. Free access is often associated with tremendous growth in demand for computing. In order to control increasing demand, administrators can institute restrictions on computer resources. Limiting disk storage space or time available at a computer terminal are common methods. Such restrictions reduce demand, but users still receive the resource free of charge. Users can also pay for the computer resources they consume through a charge back system. Under such a scheme price controls demand for computing. It is also a method of recovering the costs of operating a computer system.

All of the research sites follow a free access allocation policy with some minor restrictions on use. The colleges carry the costs of computing as overhead. This makes the resource more readily available to students and faculty members. However, it also causes problems when demand for computer resources exceeds supply. When competition for terminals increased at both Standish and Concord, as mentioned earlier in this article, faculty hesitated before giving computer assignments and students complained about the difficulty of using the resource. The free access policy, with its inherent lack of managerial control, precluded several solutions. Both institutions eventually took other steps to remedy the problem, but neither made any major changes in its allocation policy.

These brief examples illustrate structural influences on academic computer use. Personnel, facilities, and allocation policy directly affect who uses the computer, for what tasks, with what degree of ease, and at what cost. But the structural variables do not explain all of the variations in computer use. Two campuses may be quite similar in terms of these structural variables yet differ widely in their use of computing. The influence of organizational culture further explains many of the variations in academic computer use.

Cultural Influences

Every campus has its own culture. Some institutions have a "strong culture" (6) that is readily apparent. As the introduction to this article suggests, strong cultures guide the behavior of those within the organization and thus influence computer use. The section that follows examines three manifestations of culture -- saga, history, and symbols -- at the research sites. It demonstrates that each school's culture influences how the institution uses and manages computing for research and instruction.

Saga. Clark (3, 4) defines saga as a "collective understanding of unique accomplishment in a formally established group." Saga belongs to the group, it has a special meaning for them, and it provides a foundation for their involvement with the organization. Saga is important because it binds individuals to a college or university, and structures their beliefs about it. Saga tells them what the organization values, what has meaning, and what is of special significance. It is a window on the institution's values, ideology, and beliefs. Thus explication of an institution's saga is one method of

exposing the underlying values and ideologies of the organization's culture.

There are five components of a saga's fulfillment (4). The saga must have the support of key personnel such as senior faculty; there must be distinct features in the college's academic program; there must be a social base of believers outside the institution, usually alumni; student subculture should support the saga; and there should be an imagery that strengthens the saga. Each of these five aspects can indicate the presence and strength of saga.

Quincy College has a strong saga. From its founding Quincy has striven to combine liberal and professional education in career oriented programs. The school's student body, faculty members, and graduates clearly reflect and understand the school's practical approach to education. The saga also affects computing at the college. The college's president thinks of computing as a necessary "window on the world" for today's students. Quincy offers a variety of courses that use computing knowledge and skills in the liberal arts. It uses computing to bring practical applications to these courses. In addition to applications in general course work, the college also offers a major which combines computing with another liberal arts major. The program attempts to "bridge the gap" between liberal arts and practical computing skills. Thus in both general course work and the computing major, Quincy's saga influences computer use. The college combines liberal and professional studies to ready its students for practical careers in which knowledge of computing is an asset.

Concord College, a liberal arts college for women, has a very different saga. It stresses academic rigor in traditional disciplines

while allowing students to pursue other topics through independent study and extradepartmental courses. Eighty percent of the college's departments use computing in at least one course and 87 percent of a recent graduating class had computer experience. Yet, the college still has no formal computer science major. It is working towards this goal but wants to be certain that a new major will reflect the school's saga. The college will not offer a technical or career oriented major.

Banks serves as a final example of the influence of saga on computer use. The college offers business education to both undergraduates and MBA students. Its founder imparted a strong belief in excellence and leadership in management education. Personnel at the college believe that they provide this kind of educational experience. Banks uses computing in support of its saga. The college requires a basic level of computer knowledge of all its students. The president encourages faculty to use computer exercises. He knows students need access to the computer facilities and knowledge of computing. Banks provides students with knowledge of how computing supports management decisions in a business environment. Its saga has influenced the college to provide computing that reflects the directive of the school's founder for excellence and leadership in business education.

History. Institutional history provides a second window on organizational culture. History contributes to an organization's enduring value system through decisions and events (20, 26). Past behavior and statements illustrate values and beliefs in action. Examination of the organization's development often leads to discovery of the values and beliefs that shaped its growth. Of particular interest in the current analysis is the history of computing at each

research site and the identification of key individuals in those stories.

The history of computing at Standish College demonstrates that the institution does not value computing highly. The dean of the college realizes that computing is important today, but he has not expanded the college's computer resources. There are a variety of reasons for this, but one appears to be the school's traditional Catholic education which does not stress subjects such as computing. Standish places greater importance on other priorities and goals. The dean does not value computing highly enough to change the status quo.

Some members of the faculty and administration at Banks place great value on computing. This is evident in their early push for computer resources at the school and their desire for continued expansion and computer resources. But not all members of the community agree with this position. The financial vice president, to whom the director of computing reports, feels strongly that the college should never run a deficit or place itself in an unsound fiscal position. His values are in direct opposition to those of many faculty members. This is in part responsible for struggles between faculty members and administrators. Their differing values affect support for computing and thus computer use. Banks' current president emphasized the importance of computing in his inaugural address. This change of values among the college's top management will likely affect computer use at Banks in the near future.

Concord College also demonstrates the influence of conflicting values. But at Concord computing has the support of top administrators who encouraged the implementation of a computer literacy program. Opposition to computing comes from a few faculty members and

administrators who believe that computing is not congruent with the institution's traditional mission. Those who support computing eventually changed the beliefs of many who opposed computing or at least neutralized their negative influence. But the forces opposed to computing slowed the process of expanding the college's computer facility when this was necessary. Thus their beliefs had a direct influence on computer use because without the expanded services students faced severe competition for computer resources and this reduced computer use.

The values held by computer center staff members also affect computer use. At Concord, for example, the computer staff is "user-oriented." They do their utmost to help users feel at ease with the computer system. The staff members keep technology and jargon to a minimum. They strive to make the computer system "polite and friendly." This orientation is beneficial to new users who fear the computer and it also encourages users to seek advise whenever a problem arises. Service to others is highly valued at Concord. The college's philosophy, the work of alumnae, and the attitude of many faculty members towards their students reflect the importance of service to others. The computer staff's attitude and its affect on computing is an extension of the high value the college community places on service.

The values of computer staff members influence computing in the opposite way at Trowbridge Tech where the personnel are "machine-oriented." They focus on technology rather than the needs of users. They assume that users have technical sophistication and do not need much support. The staff members' attitudes reflect the technical

orientation of the institution. The nontechnical departments at Trowbridge Tech do not use the school's computer facilities to a great extent. In fact they use less computing than colleagues at some liberal arts colleges. One reason for this is the lack of support they receive from the computer personnel. Technical departments also feel the lack of user support. The chair of Computer Science, for example, feels that his students need more support because of the heavy demands they make of the system. It is evident that the staff members' "machine-orientation" influences users' experiences and thus computer use at Trowbridge Tech.

Symbols. Symbols -- "something regarded as representing something else," according to The Random House Dictionary of the English Language -- provide a third perspective on organizational culture. Symbols are another means of identifying what is important to individuals (what they value) and how they view their world (their ideology). Symbols communicate underlying values and beliefs (17). Strong feelings about the symbol, great elaboration around the symbol, or the symbol's use in many behavioral or systematic contexts signal its importance (16). Symbols are useful illustrations of the relationship between computing and organizational culture.

A symbol can demonstrate the importance placed on computing at an institution. Concord College provides a vivid example. During the past year the student computer assistants held a contest to design a T-shirt they would wear while on duty. The T-shirts would help other students identify the assistants. The winning design was so popular that many Concord students wanted to purchase a T-shirt for themselves. This

unexpected popularity surprised and pleased the computer center staff. It demonstrated to them the growing acceptance of computing at Concord and enthusiasm for computer use.

Computer facilities can also become a symbol for an institution. This is true at Banks. The schools's leadership role in forming a computer network among a number of area colleges is congruent with its belief in leadership in any endeavor it undertakes. Its extensive computer facilities also demonstrates to applicants, students, and alumni that the college is a leader in providing computer knowledge for management professionals. Banks actively takes advantage of this symbolic role in recruiting and fund raising activities. Because of the value Banks places on leadership, some faculty members have become upset as the college began to slip from the forefront of computer facilities and programs. The symbolic role of computing is important to them.

Quincy College demonstrates how the symbols used to describe computing can reflect the institution as a whole. For many years Quincy relied on several networks to provide all of its computing resources. The computer center director refered to the system as "supermarket" computing because of the value and practicality of the arrangements. He felt that users could choose from a wide selection of computer resources at modest cost--the attributes one expects of a supermarket. This description also matches the institution and its mission. The school is proud of its practical orientation towards education. The use of the supermarket metaphor demonstrates the congruency between the institution's culture and its use of computing.

Other Cultural Influences. In addition to affecting computer use organizational culture influences structural variables. Most apparent

is the affect of beliefs and values on allocation policy. Standish and Concord demonstrate the strength of the belief that computer resources should be available to every student. Administrators and faculty members value free access and believe that it is an important part of a computer literacy program. The strength of these feelings persisted even when increasing demand caused a severe shortage of computing resources. In such cases organizational beliefs interfere with use.

Decisions regarding joint or separate academic and administrative computer systems is another area where organizational culture affects structure. There are genuine advantages and disadvantages to both joint and separate systems. At Standish, Concord, and Quincy, however, beliefs and values were crucial in the decision to develop separate administrative and academic computer systems. Fear and distrust between faculty members and administrators may prompt purchase of separate academic and administrative systems when a shared system might be more cost effective. The issue of sharing a system is often an emotional one. There tend to be stronger feelings around this issue than any other related to computing in higher education.

Culture can also influence personnel structure. Banks provides an excellent example of this. The school's saga and administrative beliefs stress the importance of business-like decisions and good financial management. Thus it made sense to have the director of computing report to the financial vice president. A very different structure developed at Quincy College. The college values the individual efforts of administrators and faculty members. Quincy's computer staffing reflects this as the college is quite dependent on the efforts of one faculty member who has acted as a catalyst for computing.

The Reciprocal Influences of Computer Use

Earlier the article discussed the affect of the introduction of microcomputers on computing at Quincy. These changes in use have a reciprocal influence on structure. As computers proliferate and become more widely available, there are more users with widely different demands on the campus. This may change the membership of a computer committee. Beyond this it can change the role of the computer center director. Widespread and decentralized facilities may introduce the need for a computer czar to oversee all computer operations. This would be an extension of relatively tight control over computing. On the other hand, proliferation may prompt decentralization of managerial control. Computers may be treated like laboratory equipment or typewriters that are controlled by individual users or departments.

Perhaps the most intriguing influence is that of computer use on organizational culture. Computer use often produces changes in beliefs and values. Faculty who begin to use computer resources for one purpose often become computer "converts." Many individuals use the word convert, a term that connotes a change in underlying values and beliefs, to describe this phenomenon. Once faculty members begin to use computing for one task, their beliefs about computing change because they understand its value in their daily work. Faculty become interested in what the resource does for them and use it for an increasing variety of purposes. They demand computer resources which have become a "necessity." They often share their enthusiasm with colleagues. This is very apparent at Concord as a result of computer literacy seminars for faculty. The "convert" phenomenon illustrates the reciprocal relationship between use and organizational culture. Changing

patterns of computer use influence the values and beliefs of the organization's members.

Implications

There is no question that computer resources are an important tool for higher education. Yet after several decades of expanding use (1) a wide variety of managerial problems still plagues their use. Many campuses do not exploit computer resources and complaints of computer "illiteracy" are still widespread (11, 14, 17). The literature on computing in higher education suggests structural solutions to such common managerial problems. The evidence cited in this article validates the importance of structural characteristics such as personnel, facilities, and allocation policy. The effects on organizational culture, however, are largely ignored in the current literature. Culture, as demonstrated through saga, history, and symbols, also influences how an institution uses computing in its computer-related courses and programs. Organizational culture affects the people and structure that support computing efforts.

Each of the five schools described in his article has what Deal and Kennedy (6) call a "strong culture." The influence of values and beliefs is readily apparent and widely agreed upon. Thus it is relatively easy to outline the cultural influence on computing. Each of the research sites has a distinct mission and culture which has affected computer use. There may be some disagreement about the culture. This is true at Banks where one culture stresses excellence and leadership in management education and another culture values conservative management and fiscal policies. But even in this case the influence of culture is clear.

Organizational culture is not always so readily apparent. A college or university may not have strongly held values and beliefs or an institution may have several sets of differing values that produce a confusing cultural image at best. Clark (3) notes that sagas may be specific to smaller units within large institutions. At a large university, for example, the college of engineering might have a different saga than the college of education. Thus while an entire institution might not have a strong culture, subunits within the organization might have strong cultural influences. Differing cultures on one campus could produce conflicting demands of computer resources or computer resources that do not meet anyone's needs.

American colleges and universities vary widely on a multitude of dimensions. Cultural differences are one aspect of these variations. If, as this article contends, organizational culture influences computer use, it is not realistic to expect that all campuses should use computing in the same way. From the earliest days of computer use, commissions and reports have suggested how higher education should use computing (2, 10, 24). A multitude of complaints still exist that colleges and universities are not fully utilizing computers and that today's students are still computer illiterates (8, 11, 14). It simply is not realistic to expect all institutions to conform to broad-based criteria of computing expectations. Unique cultures produce unique computer applications. The many cultures of higher education preclude one approach to computing among colleges and universities.

The relationships illustrated in Figure 1 and discussed in this article are reciprocal in nature because they operate among all three factors in a circular fashion. Examination of historical data gives a

reference to how the factors operate at a particular institution. The development and growth of computer resources demonstrate how the factors have interacted in the past. Looking at current computer use in relation to cultural values and beliefs indicates how computing might progress and change in the future. Every institution should develop computer resources in light of its own structural, cultural, and utilization characteristics.

Table 1

Institutional Characteristics

	Trowbridge Tech	Banks College	Quincy College	Standish College	Concord College
Affiliation	Independent	Independent	Independent	Catholic	Independent
Degrees Offered	Bachelor Master Doctoral	Bachelor Master	Bachelor Master Doctoral	Bachelor	Bachelor
Number of Majors	18	11	19	15	26
Faculty (Approximate)	225	100	200	75	250
Enrollment (Approximate)	2500 undergrads 200 graduate	1500 undergrads 200 full-time MBAs 1600 part-time MBAs	2000 undergrads 600 graduate	1000 undergrads	2000 undergrads
Geographical Distribution of Students	30 States 45 Countries	30 States 40 Countries	25 States 10 Countries	20 States 15 Countries	50 States 50 Countries
Tuition (81-82) (Approximate)	$6,000	$5,000	$6,000	$4,000	$6,500
Percent Students on Financial Aid	80	35	40	80	70

Table 2

Characteristics of Computer Personnel

	Trowbridge Tech	Banks College	Quincy College	Standish College	Concord College
Position	Computer Center Director	Computer Center Director	Computer Center Director	---	Computer Center Director
Reports to	President	Financial Vice President	President	Dean of the College	Dean of the College
Professional Staff	5.5	5	1	0	4
Student Staff	2	12	8	0	29
Role	Machine-oriented Proactive	Machine-oriented Reactive	User-oriented Reactive	---	User-oriented Proactive
Top Management Support	Active	Inactive	Inactive	Inactive	Active

Table 3

Characteristics of Computer Allocation Policy

	Trowbridge Tech	Banks College	Quincy College	Standish College	Concord College
Policy	Free Access	Free Access	Free Access	Free Access	Free Access
Signup Sheets	No	No	1 Hour	No	2 Hours

Table 4

Characteristics of Computer Facilities

	Trowbridge Tech	Banks College	Quincy College	Standish College	Concord College
Computer(s)	UNIVAC 90/60 DEC-20 DG NV/8000	PDP 11/70 VAX 11/780	HP3000 Series III Networking	Networking	DEC-20 Prime I5000 (Administrative)
Microcomputers	Many	Limited	Apples	TRS80s	Apples
Academic and Administrative	Joint	Joint Facility (Separate Machines)	Joint	Separate	Separate

Table 5

Characteristics of Computer Use

	Trowbridge Tech	Banks College	Quincy College	Standish College	Concord College
Computer Literacy Goal	Implicit	Explicit	Not Important	Not Important	Explicit
Required Course	Yes	Yes	No	No	No
Major	Computer Science	No	Applied Computer Science	Proposed Certificate	Proposed Major
Word Processing	Yes	Yes	No	No	Yes

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